

# PATENT ABSTRACTS OF JAPAN

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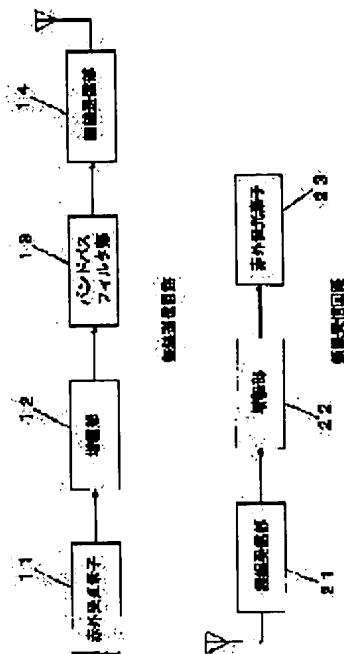
(71)Applicant : MATSUSHITA ELECTRIC  
IND CO LTD

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(72)Inventor : MURAKAMI KENICHI

## (54) LIGHT RECEIVING SECTION FOR MULTI-REMOTE CONTROLLER



(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a light receiving section for a multi-remote controller that relays radio data of a remote controller with a different carrier frequency to a remote place and to allow the remote controller to emits an infrared ray with the original same carrier frequency.

SOLUTION: Infrared ray data received by an infrared ray receiving element 11 are demodulated while including a carrier and outputted by an amplifier section 12, the amplifier section 12 converts the voltage level and outputs data to a band-pass filter section 13, which passes only data with a specific frequency band and outputs the data to a radio transmission section 14. The radio transmission section 14 transmits data to a radio reception circuit. A radio reception section 21 of the radio reception circuit receives the data, an amplifier section 22 converts the voltage level and provides an output to an

infrared ray emission element 23. The infrared ray emission element 23 emits a light when the signal received by the infrared ray emission element 23 is 5 V and emits no light when 0 V to convert the received data into an infrared ray and sends the infrared ray data to an AV device.

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[Claim(s)]

[Claim 1] The infrared photo detector which receives the infrared radiation transmitted from remote control, and the amplifier which amplifies the voltage level of the data which said infrared photo detector outputted, The band pass filter section which picks out only the data of a specific frequency band from the data which said amplifier outputted, With the wireless sending circuit which consists of the wireless transmitting section which makes an electric wave the data which passed said band pass filter section, and transmits, and the wireless receive section which receives the electric wave which said wireless transmitting section transmitted The amplifier which amplifies the voltage level of the data which said wireless receive section outputted, It consists of wireless receiving circuits which consist of an infrared light emitting device which changes into infrared radiation the data which said amplifier outputted, and emits light. The remote-controller-units-installed-in-multiple-location light sensing portion characterized by hooking up to the place which left the data of the remote control with which carrier frequency differs by wireless, and enabling it to emit light in infrared radiation with the same carrier frequency of a basis.

#### DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the remote-controller-units-installed-in-multiple-location light sensing portion which can receive the infrared data with which carrier frequency differs.

[0002]

[Description of the Prior Art] The remote control which used infrared radiation for all AV equipments is attached in recent years, and the remote operation within the limits which direct infrared radiation reaches is attained. Moreover, the data transmitted from remote control of AV equipment attachment in order to make operational the AV equipment put on a place where direct infrared radiation does not reach inside with attached remote control receive, it acts as intermediary using wireless, and the remote-control data radio relay device which it had in the remote-controller-units-installed-in-multiple-location light sensing portion which can be operated with attached remote control by restoring to wireless and emitting light in front of the AV equipment set to the place which direct infrared radiation does not reach is used.

[0003] Hereafter, the conventional remote-controller-units-installed-in-multiple-location light sensing portion is explained, referring to a drawing. Drawing 2 is the block diagram of the remote control data radio relay device equipped with the conventional remote-controller-units-installed-in-multiple-location light sensing portion. It is the wireless transmitting section which the filter section which takes out only the data of a specific frequency, and 34 make an electric wave the data which passed the filter section 33, and transmits, and the wireless sending circuit is constituted from an infrared photo detector which receives the infrared radiation with which 31 has been transmitted from remote control in drawing 2, an amplifier which amplifies the voltage level of the data with which the infrared photo detector 31 outputted 32, and data with which the amplifier 32 outputted 33 by these.

[0004] The wireless receive section where 41 receives the electric wave which the wireless transmitting section 34 transmitted, the oscillation section which oscillates a subcarrier on the frequency (37kHz of examples) of specification [ 42 ], and 43 are with the data which the wireless receive section 41 outputted, and the subcarrier which the oscillation section 42 outputted. The modulation section which modulates AND logic which does not output a subcarrier when data are 0, but outputs a subcarrier when data are 1, It is the amplifier which amplifies the voltage level of the data with which the modulation section 43 outputted 44, and the infrared light emitting device which 45 changes into infrared radiation the data which the amplifier 44 outputted, and emits light, and the wireless receiving circuit is constituted by these.

[0005] About the remote control data radio relay device equipped with the conventional remote-controller-units-installed-in-multiple-location light sensing portion constituted as mentioned above, the actuation is explained below. The above-mentioned wireless receiving circuit is placed in front of the AV equipment put on the place of the range which direct infrared radiation does not reach from attached remote control of an AV equipment. Moreover, the above-mentioned wireless sending circuit is established in the place of the range which direct infrared radiation reaches from attached remote control of an AV equipment.

[0006] Data are first outputted with infrared radiation from attached remote control of an AV equipment. While the subcarrier had been included, it gets over to data, and the data of the infrared radiation received by the infrared photo detector 31 of the above-mentioned wireless sending circuit are outputted to an amplifier 32. Data logic 1 performs 5V to 0V, data logic 0 changes a voltage level for said data, and an amplifier 32 outputs data to the filter section 33. In the inputted data, the filter section 33 passes only data with specific carrier frequency (37kHz of examples), and is outputted to the wireless transmitting section 34. The wireless transmitting section 34 modulates the inputted data, and performs wireless transmission to the above-mentioned wireless receiving circuit.

[0007] The wireless receive section 41 of the above-mentioned wireless receiving circuit receives the data by which wireless transmission was carried out from the wireless transmitting section 34 of the above-mentioned wireless sending circuit, and outputs to the modulation section 43. The oscillation section 42 oscillates a subcarrier on a specific frequency (37kHz of examples), and outputs it to the modulation section 43. It is with the data which the wireless receive section 41 outputted, and the subcarrier which the oscillation section 42 outputted, the modulation section 43 does not output a subcarrier, when data are 0, but when data are 1, modulates AND logic which outputs a subcarrier and outputs the data to an amplifier 44. Data logic 1 performs 5V to 0V, data logic 0 changes a voltage level, and an amplifier 44 outputs the inputted data to the infrared light emitting device 45. The infrared light emitting device 45 is emitting light at the time of 5V, and not emitting light at the time of 0V, changes the inputted data into infrared radiation, and sends out infrared data to an AV equipment. The AV equipment which has the infrared radiation of remote control of attachment of an AV equipment by this in a direct report or the place which is not also becomes operational with attached remote control.

[0008]

[Problem(s) to be Solved by the Invention] However, although only the data of infrared radiation with specific carrier frequency (37kHz of examples) could receive light with the

above-mentioned conventional configuration, when, as for remote control of attachment of an AV equipment, the model differed from the manufacturer, the technical problem that there will be remote control which the carrier frequency of the infrared radiation of the remote control differs variously (30 to 60 kHz example), therefore cannot carry out a radio relay occurred.

[0009] This invention relays the data of the remote control with which infrared carrier frequency differs in view of the above-mentioned conventional technical problem to the place left by wireless, is being able to emit light in infrared radiation with the same carrier frequency of a basis, and aims at offering the remote-controller-units-installed-in-multiple-location light sensing portion to which the infrared data is made as for a radio relay also with the remote control with which a model differs from a manufacturer.

[0010]

[Means for Solving the Problem] The infrared photo detector which receives the infrared radiation with which this invention has been transmitted from remote control, The amplifier which amplifies the voltage level of the data which said infrared photo detector outputted, The band pass filter section which picks out only the data of a specific frequency band from the data which said amplifier outputted, With the wireless sending circuit which consists of the wireless transmitting section which makes an electric wave the data which passed said band pass filter section, and transmits, and the wireless receive section which receives the electric wave which said wireless transmitting section transmitted The amplifier which amplifies the voltage level of the data which said wireless receive section outputted, It consists of wireless receiving circuits which consist of an infrared light emitting device which changes into infrared radiation the data which said amplifier outputted, and emits light, hooks up to the place which left the data of the remote control with which carrier frequency differs by wireless, and enabled it to emit light in infrared radiation with the same carrier frequency of a basis.

[0011] By this configuration, the remote-controller-units-installed-in-multiple-location light sensing portion to which that infrared data is made as for a radio relay also with the remote control with which a model differs from a manufacturer can be offered.

[0012]

[Embodiment of the Invention] The infrared photo detector which receives the infrared radiation with which invention according to claim 1 has been transmitted from remote control, The amplifier which amplifies the voltage level of the data which said infrared photo detector outputted, The band pass filter section which picks out only the data of a specific frequency band from the data which said amplifier outputted, With the wireless sending circuit which consists of the wireless transmitting section which makes an electric wave the data which passed said band pass filter section, and transmits, and the wireless receive section which receives the electric wave which said wireless transmitting section transmitted The amplifier which amplifies the voltage level of the data which said wireless receive section outputted, It consists of wireless receiving circuits which consist of an infrared light emitting device which changes into infrared radiation the data which said amplifier outputted, and emits light, hooks up to the place which left the data of the remote control with which carrier frequency differs by wireless, and enabled it to emit light in infrared radiation with the same carrier frequency of a basis.

[0013] By this configuration, a radio relay can do that infrared data also with the remote control with which a model differs from a manufacturer.

[0014] Hereafter, the gestalt of operation of this invention is explained, referring to a drawing. Drawing 1 is the block diagram of the remote control data radio relay device equipped with the remote-controller-units-installed-in-multiple-location light sensing portion in the gestalt of 1 operation of this invention. It is the wireless transmitting section which the infrared photo detector which receives the infrared radiation with which 11 has been transmitted from remote control in drawing 1, the amplifier which amplifies the voltage level of the data with which the infrared photo detector 11 outputted 12, the band pass filter section which picks out only the data of a specific frequency band (30 to 60 kHz example) from the data with which the amplifier 12 outputted 13, and 14 make an electric wave the data which passed the band pass filter section 13, and transmits, and the wireless sending circuit is constituted by these.

[0015] It is the infrared light emitting device which the wireless receive section where 21 receives the electric wave which the wireless transmitting section 14 transmitted, the amplifier which amplifies the voltage level of the data with which the wireless receive section 21 outputted 22, and 23 change into infrared radiation the data which the amplifier 22 outputted, and emits light, and the wireless receiving circuit is constituted by these.

[0016] About the remote control data radio relay device equipped with the remote-controller-units-installed-in-multiple-location light sensing portion constituted as mentioned above, the actuation is explained below. The above-mentioned wireless receiving circuit is placed in front of the AV equipment put on the place of the range which direct infrared radiation does not reach from attached remote control of an AV equipment. Moreover, the above-mentioned wireless sending circuit is established in the place of the range which direct infrared radiation reaches from attached remote control of an AV equipment.

[0017] Data are first outputted with infrared radiation from attached remote control of an AV equipment. While the subcarrier had been included, it gets over to data, and the data of the infrared radiation received by the infrared photo detector 11 of the above-mentioned wireless sending circuit are outputted to an amplifier 12. Data logic 1 performs 5V to 0V, data logic 0 changes a voltage level for said data, and an amplifier 12 outputs data to the band pass filter section 13. In the inputted data, the band pass filter section 13 passes only data with a specific frequency band (30 to 60 kHz example), and is outputted to the wireless transmitting section 14. The wireless transmitting section 14 modulates the inputted data, and performs wireless transmission to the above-mentioned wireless receiving circuit.

[0018] The wireless receive section 21 of the above-mentioned wireless receiving circuit receives the data by which wireless transmission was carried out from the wireless transmitting section 14 of the above-mentioned wireless sending circuit, and outputs to an amplifier 22. Data logic 1 performs 5V to 0V, data logic 0 changes a voltage level, and an amplifier 22 outputs the inputted data to the infrared light emitting device 23. The infrared light emitting device 23 is emitting light at the time of 5V, and not emitting light at the time of 0V, changes the inputted data into infrared radiation, and sends out infrared data to an AV equipment.

[0019] As mentioned above, according to the gestalt of this operation, the data of the remote control with which infrared carrier frequency differs are relayed to the place left by wireless, and a radio relay can do the infrared data also with the remote control with

which a model differs from a manufacturer by the ability of light to be emitted in infrared radiation with the same carrier frequency of a basis.

[0020]

[Effect of the Invention] Since this invention has prepared the band pass filter section which takes out only the data of a specific frequency band in the wireless transmitting section, it can be relayed to the place which left the data of the remote control with which carrier frequency differs by wireless, and can emit light in infrared radiation with the same carrier frequency of a basis.

#### DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The block diagram of the remote control data radio relay device equipped with the remote-controller-units-installed-in-multiple-location light sensing portion in the gestalt of 1 operation of this invention

[Drawing 2] The block diagram of the remote control data radio relay device equipped with the conventional remote-controller-units-installed-in-multiple-location light sensing portion

[Description of Notations]

11 Infrared Photo Detector

12 Amplifier

13 Band Pass Filter Section

14 Wireless Transmitting Section

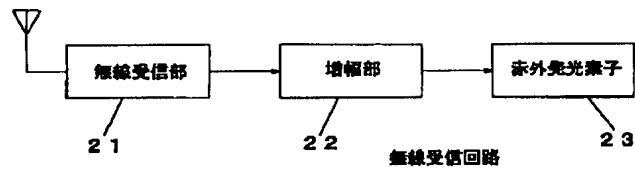
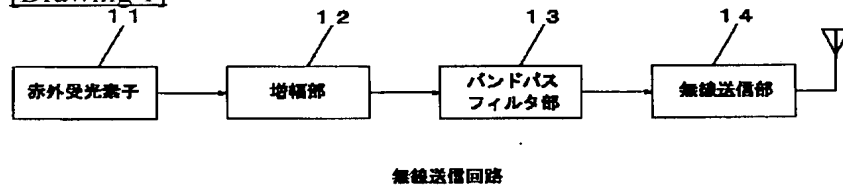
21 Wireless Receive Section

22 Amplifier

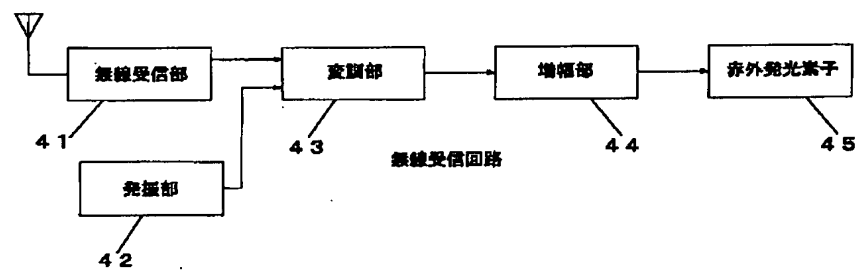
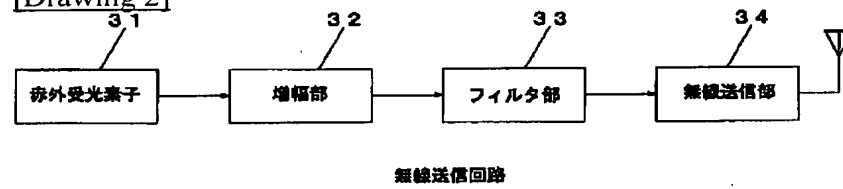
23 Infrared Light Emitting Device

# DRAWINGS

[Drawing 1]



[Drawing 2]





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(71) 出願人 000003821

松下電器産業株式会社

大阪府門真市大字門真1006番地

(72) 発明者 村上 健一

大阪府門真市大字門真1006番地 松下電器  
産業株式会社内

(74) 代理人 100097445

弁理士 岩橋 文雄 (外2名)

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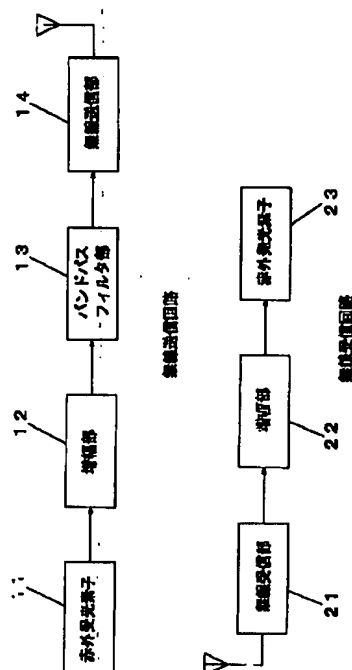
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(54) 【発明の名称】 マルチリモコン受光部

(57) 【要約】

【課題】 搬送波周波数の異なるリモコンのデータを無線によって離れたところに中継し、もとの同じ搬送波周波数で赤外線を発光できるマルチリモコン受光部を提供することを目的とする。

【解決手段】 赤外受光素子11に受光された赤外線のデータは搬送波を含んだまま復調され増幅部12に出力され、増幅部12は電圧レベルの変換を行い、バンドパスフィルタ部13にデータを出力し、バンドパスフィルタ部13は特定の周波数帯域のデータのみを通過させ、無線送信部14に出力する。無線送信部14は無線受信回路へ無線送信を行う。無線受信回路の無線受信部21は、データを受信し、増幅部22は電圧レベルの変換を行い、赤外発光素子23に出力する。赤外発光素子23は5Vの時には発光し、0Vの時には発光しないことで、入力したデータを赤外線に変換してAV機器に赤外線データを送出する。



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## 【特許請求の範囲】

【請求項1】リモコンより送信されてきた赤外線を受光する赤外受光素子と、前記赤外受光素子が出力したデータの電圧レベルを増幅する増幅部と、前記増幅部が出力したデータから特定周波数帯域のデータのみを取り出すバンドパスフィルタ部と、前記バンドパスフィルタ部を通過したデータを電波にして送信する無線送信部からなる無線送信回路、及び前記無線送信部が送信した電波を受信する無線受信部と、前記無線受信部が出力したデータの電圧レベルを増幅する増幅部と、前記増幅部が出力したデータを赤外線に変換し発光する赤外発光素子からなる無線受信回路から構成され、搬送波周波数の異なるリモコンのデータを無線によって離れたところに中継し、もとの同じ搬送波周波数で赤外線を発光できるようにしたことを特徴とするマルチリモコン受光部。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、搬送波周波数の異なる赤外線データを受光可能なマルチリモコン受光部に関するものである。

## 【0002】

【従来の技術】近年、あらゆるAV機器に赤外線を利用したリモコンが付属され、直接赤外線が届く範囲内での遠隔操作が可能になってきた。また中には直接赤外線が届かないような所に置かれたAV機器を付属のリモコンにより操作可能とするため、AV機器付属のリモコンから送信されたデータを受光し無線を利用して中継し、直接赤外線が届かない所におかれたAV機器の前で無線を復調し発光することで、付属のリモコンにより操作できるマルチリモコン受光部を備えたリモコンデータ無線中継機が利用されてきている。

【0003】以下、図面を参照しながら従来のマルチリモコン受光部について説明を行う。図2は従来のマルチリモコン受光部を備えたリモコンデータ無線中継機の構成図である。図2に於いて31はリモコンより送信されてきた赤外線を受光する赤外受光素子、32は赤外受光素子31が出力したデータの電圧レベルを増幅する増幅部、33は増幅部32が出力したデータから、特定周波数のデータのみを取り出すフィルタ部、34はフィルタ部33を通過したデータを電波にして送信する無線送信部であり、これらにより無線送信回路が構成されている。

【0004】41は無線受信部34が送信した電波を受信する無線受信部、42は特定の周波数(例37KHz)でサブキャリアを発振する発振部、43は無線受信部41が出力したデータと、発振部42が出力したサブキャリアとで、データが0のときはサブキャリアを出力せず、データが1のときはサブキャリアを出力するAND論理の変調を行う変調部、44は変調部43が出力したデータの電圧レベルを増幅する増幅部、45は増幅部

44が出力したデータを赤外線に変換し発光する赤外発光素子であり、これらにより無線受信回路が構成されている。

【0005】以上のように構成された従来のマルチリモコン受光部を備えたリモコンデータ無線中継機について、以下その動作を説明する。AV機器の付属リモコンから直接赤外線が届かない範囲の所に置かれたAV機器の前には、上記無線受信回路が置かれている。またAV機器の付属リモコンから直接赤外線が届く範囲の所には、上記無線送信回路が置かれている。

【0006】まずAV機器の付属リモコンから赤外線データが出力される。上記無線送信回路の赤外受光素子31によって受光された赤外線のデータは、搬送波を含んだままデータに復調され増幅部32に出力する。増幅部32は前記データをデータ論理1は5V、データ論理0は0Vに電圧レベルの変換を行い、フィルタ部33にデータを出力する。フィルタ部33は入力したデータの中で、特定の搬送波周波数(例37KHz)を持つデータのみを通過させ、無線送信部34に出力する。無線送信部34は入力したデータを変調し、上記無線受信回路へ無線送信を行う。

【0007】上記無線受信回路の無線受信部41は、上記無線送信回路の無線送信部34から無線送信されたデータを受信し、変調部43に出力する。発振部42は、特定の周波数(例37KHz)でサブキャリアを発振し、変調部43に出力する。変調部43は、無線受信部41が出力したデータと、発振部42が出力したサブキャリアとで、データが0のときはサブキャリアを出力せず、データが1のときはサブキャリアを出力する、AND論理の変調を行い、そのデータを増幅部44に出力する。増幅部44は入力したデータをデータ論理1は5V、データ論理0は0Vに電圧レベルの変換を行い、赤外発光素子45に出力する。赤外発光素子45は5Vの時には発光し、0Vの時には発光しないことで、入力したデータを赤外線に変換して、AV機器に赤外線データを送出する。これによってAV機器の付属のリモコンの赤外線が、直接届かない所にあるAV機器でも、付属のリモコンによって操作可能となる。

## 【0008】

【発明が解決しようとする課題】しかしながら上記従来の構成では、特定の搬送波周波数(例37KHz)をもつ赤外線のデータしか受光できないが、AV機器の付属のリモコンは機種やメーカーが異なると、そのリモコンの赤外線の搬送波周波数はまちまちに異なっており(例30-60KHz)、そのため無線中継できないリモコンがあってしまうという課題があった。

【0009】本発明は、上記従来の課題に鑑み、赤外線の搬送波周波数が異なるリモコンのデータを、無線によって離れたところに中継し、もとの同じ搬送波周波数で赤外線を発光できる事で、機種やメーカーが異なるリモ

コンでも、その赤外線データを無線中継ができるマルチリモコン受光部を提供することを目的とする。

#### 【0010】

【課題を解決するための手段】本発明は、リモコンより送信されてきた赤外線を受光する赤外受光素子と、前記赤外受光素子が出力したデータの電圧レベルを増幅する増幅部と、前記増幅部が出力したデータから特定周波数帯域のデータのみを取り出すバンドパスフィルタ部と、前記バンドパスフィルタ部を通過したデータを電波にして送信する無線送信部からなる無線送信回路、及び前記無線送信部が送信した電波を受信する無線受信部と、前記無線受信部が出力したデータの電圧レベルを増幅する増幅部と、前記増幅部が出力したデータを赤外線に変換し発光する赤外発光素子からなる無線受信回路から構成され、搬送波周波数の異なるリモコンのデータを無線によって離れたところに中継し、もとの同じ搬送波周波数で赤外線を発光できるようにした。

【0011】この構成により、機種やメーカーが異なるリモコンでも、その赤外線データを無線中継ができるマルチリモコン受光部を提供することができる。

#### 【0012】

【発明の実施の形態】請求項1に記載の発明は、リモコンより送信されてきた赤外線を受光する赤外受光素子と、前記赤外受光素子が出力したデータの電圧レベルを増幅する増幅部と、前記増幅部が出力したデータから特定周波数帯域のデータのみを取り出すバンドパスフィルタ部と、前記バンドパスフィルタ部を通過したデータを電波にして送信する無線送信部からなる無線送信回路、及び前記無線送信部が送信した電波を受信する無線受信部と、前記無線受信部が出力したデータの電圧レベルを増幅する増幅部と、前記増幅部が出力したデータを赤外線に変換し発光する赤外発光素子からなる無線受信回路から構成され、搬送波周波数の異なるリモコンのデータを無線によって離れたところに中継し、もとの同じ搬送波周波数で赤外線を発光できるようにした。

【0013】この構成により、機種やメーカーが異なるリモコンでも、その赤外線データを無線中継ができる。

【0014】以下、本発明の実施の形態について、図面を参照しながら説明する。図1は本発明の一実施の形態におけるマルチリモコン受光部を備えたリモコンデータ無線中継機器の構成図である。図1において、11はリモコンより送信されてきた赤外線を受光する赤外受光素子、12は赤外受光素子11が出力したデータの電圧レベルを増幅する増幅部、13は増幅部12が出力したデータから特定周波数帯域（例30-60KHz）のデータのみを取り出すバンドパスフィルタ部、14はバンドパスフィルタ部13を通過したデータを電波にして送信する無線送信部であり、これらにより無線送信回路が構成されている。

【0015】21は無線受信部14が送信した電波を受

信する無線受信部、22は無線受信部21が出力したデータの電圧レベルを増幅する増幅部、23は増幅部22が出力したデータを、赤外線に変換し発光する赤外発光素子であり、これらにより無線受信回路が構成されている。

【0016】以上のように構成されたマルチリモコン受光部を備えたリモコンデータ無線中継機器について、以下その動作を説明する。AV機器の付属リモコンから直接赤外線が届かない範囲の所に置かれたAV機器の前には、上記無線受信回路が置かれている。またAV機器の付属リモコンから直接赤外線が届く範囲の所には、上記無線送信回路が置かれている。

【0017】まずAV機器の付属リモコンから赤外線データが出力される。上記無線送信回路の赤外受光素子11によって受光された赤外線データは、搬送波を含んだままデータに復調され増幅部12に出力する。増幅部12は前記データをデータ論理1は5V、データ論理0は0Vに電圧レベルの変換を行い、バンドパスフィルタ部13にデータを出力する。バンドパスフィルタ部13は入力したデータの中で、特定の周波数帯域（例30-60KHz）を持つデータのみを通過させ、無線送信部14に出力する。無線送信部14は入力したデータを変調し、上記無線受信回路へ無線送信を行う。

【0018】上記無線受信回路の無線受信部21は、上記無線送信回路の無線送信部14から無線送信されたデータを受信し、増幅部22に出力する。増幅部22は入力したデータをデータ論理1は5V、データ論理0は0Vに電圧レベルの変換を行い、赤外発光素子23に出力する。赤外発光素子23は5Vの時には発光し、0Vの時には発光しないことで、入力したデータを赤外線に変換して、AV機器に赤外線データを送出する。

【0019】以上のように本実施の形態によれば、赤外線の搬送波周波数が異なるリモコンのデータを、無線によって離れたところに中継し、もとの同じ搬送波周波数で赤外線を発光できる事で、機種やメーカーが異なるリモコンでも、その赤外線データを無線中継ができる。

#### 【0020】

【発明の効果】本発明は、無線送信部に、特定周波数帯域のデータのみを取り出すバンドパスフィルタ部を設けているので、搬送波周波数の異なるリモコンのデータを無線によって離れたところに中継し、もとの同じ搬送波周波数で赤外線を発光することができる。

#### 【図面の簡単な説明】

【図1】本発明の一実施の形態におけるマルチリモコン受光部を備えたリモコンデータ無線中継機器の構成図

【図2】従来のマルチリモコン受光部を備えたリモコンデータ無線中継機器の構成図

#### 【符号の説明】

11 赤外受光素子

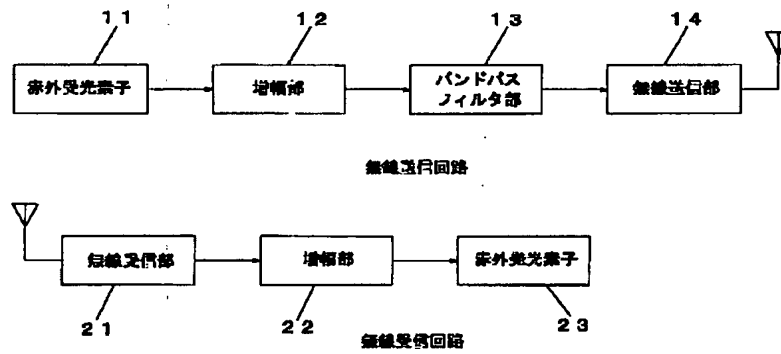
12 増幅部

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13 バンドパスフィルタ部  
14 無線送信部  
21 無線受信部

22 増幅部  
23 赤外発光素子

【図1】



【図2】

